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SURROUND ENTERTAINMENT SYSTEM FOR A FIREPLACE

Background of the Invention

Field of the Invention

The present invention generally relates to surrounds for heating appliances, and more specifically relates to modular surround entertainment systems that include entertainment hardware.

Related Art

Decorative surrounds are commonly used to enhance the look and feel of a heating appliance (e.g., a fireplace or stove) and also function to cover otherwise unsightly features of the heating appliance (e.g., vents and the unfinished edge of the surrounding wall structure). Such surrounds typically include a top member that extends horizontally above the heating appliance, and two side members that extend vertically along opposing sides of the heating appliance. The horizontal and side members are often secured together as a single assembled piece that is mounted to the wall structure surrounding the fireplace. In other applications, the separate members are individually mounted to the wall structure surrounding the fireplace. Some surrounds include a mantle that is either integrated into the top member or is separately mounted on top of or on a front face of the surround. Most surrounds have little functionality beyond the "shelf" function of the mantle and the covering function of the surround generally.

In many homes and other dwelling structures, entertainment hardware such as televisions, stereo systems, computers, and DVD players are competing with heating appliances for space as well as the focus of attention in the living space. In some cases, the importance of the entertainment hardware is greater than the heating and aesthetic benefits of a heating appliance and the heating appliance surround. A heating appliance surround having functionality that addresses these competing interests would be an advance in the art.

Summary of the Invention

The present invention relates to surrounds for heating appliances that include entertainment hardware. One aspect of the invention relates to a surround entertainment system configured for use with a fireplace that includes a decorative surround, a display monitor coupled to the surround, a sound system positioned at least partially within the surround, and a signal module positioned at least partially within the surround and configured to provide a video signal to the display monitor and an audio signal to the sound system.

Another aspect of the invention relates to a fireplace mantle assembly that includes a mantle defining first and second recessed portions, a display monitor positioned at least partially within the first recessed portion, and a video device coupled positioned at least partially within the second recess.

A further aspect of the invention relates to a decorative audio and video entertainment assembly that includes a decorative surround for a heating appliance, a display screen coupled to the surround and configured to provide a video display in response to a video signal, and a sound system positioned at least partially within a recessed portion of the surround and configured to provide sound in response to an audio signal.

A yet further aspect of the invention relates to a method of assembling a surround entertainment system that is configured for use with a heating appliance. The system includes a surround, a display monitor, a sound system, and a signal module. The method includes forming first and second recessed portions in the surround, positioning the signal module in at least a portion of the first recessed portion, positioning the sound system in at least a portion of the second recessed portion, and coupling the display monitor to the surround.

Another aspect of the invention relates to a decorative surround for a heating appliance that includes a first recessed portion configured to receive at least a portion of a display monitor, a second recessed portion configured to receive at least a

portion of a signal module, and a third recessed portion configured to receive at least a portion of a sound system.

The above summary of the present invention is not intended to describe each disclosed embodiment or every implementation of the present invention. Figures in the detailed description that follow more particularly exemplify embodiments of the invention. While certain embodiments will be illustrated and described, the invention is not limited to use in such embodiments.

Brief Description of the Drawings

The invention may be more completely understood in consideration of the following detailed description of various embodiments of the invention in connection with the accompanying drawings, in which:

Figure 1 is a front perspective view of an example surround entertainment system according to principles of the present invention with a display monitor and a signal module in viewable positions;

Figure 2 is a front perspective view of the system shown in Figure 1 with the display monitor and signal module in non-viewable positions;

Figure 3 is an exploded front perspective view of the system shown in Figure 1;

Figure 4 is a front view of the system shown in Figure 1;

Figure 5 is a cross-sectional view of the system shown in Figure 4 taken along cross-sectional indicators 5-5;

Figure 6 is a cross-sectional view of the system shown in Figure 4 taken along cross-sectional indicators 6-6;

Figure 7 is a close up view of the display monitor mounting assembly shown in Figure 6;

Figure 8 is a front view of the system shown in Figure 2;

Figure 9 is cross-sectional view of the system shown in Figure 8 taken along cross-sectional indicators 9-9;

Figure 10 is a cross-sectional view of the system shown in Figure 8 taken along cross-sectional indicators 10-10;

Figure 11 is a close up view of the display monitor mounting assembly shown in Figure 10;

Figure 12 is a front perspective view of another example surround entertainment system according to principles of the present invention with a display monitor and a signal module in viewable positions;

Figure 13 is an exploded perspective view of the system shown in Figure 12;

Figure 14 is a front view of the system shown in Figure 12;

Figure 15 is a cross-sectional view of the system shown in Figure 14 taken along cross-sectional indicators 15-15;

Figure 16 is a close up view of the display monitor mounting assembly shown in Figure 14;

Figure 17 is a front view of the system shown in Figure 12 with the display monitor and signal module in non-viewable positions;

Figure 18 is a cross-sectional view of the system shown in Figure 17 taken along cross-sectional indicators 18-18; and

Figure 19 is a close up view of the display monitor mounting assembly shown in Figure 18.

While the invention is amenable to various modifications and alternant forms, specifics thereof have been shown by way of example and the drawings and will be described in detail. It should be understood, however, that the intention is not to limit the invention to the particular embodiments described. On the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention.

Detailed Description of the Preferred Embodiment

The present invention generally relates to surrounds for heating appliances, and more specifically relates to surrounds that include entertainment

hardware such as a display monitor and a sound system. The surround functions as a modular entertainment system in that the entertainment hardware is positioned within or otherwise mounted to the surround.

In preferred embodiments, the surround entertainment system can be transported as a single unit and eventually installed as a single unit by merely securing the surround to a support structure (e.g., a stud wall) and providing power to the entertainment hardware. The entertainment hardware may be positioned with respect to various features of the surround so that the entertainment hardware is concealed from view, and the position of the entertainment hardware and surround may be altered to expose certain entertainment hardware for viewing or control of the hardware.

As used herein, the term "surround" means any exposed structural surface that covers at least a portion of the front surface of a heating appliance and provides a transition from the combustible materials surrounding the heating appliance (such as, for example, a stud wall) to the front panel of the heating appliance. The "surround" may function as a door or similar structure that provides access to otherwise covered features of the heating appliance. The phrase "viewing surface" is any surface through which at least a portion of an interior of the heating appliance may be viewed. For example, a viewing surface may consist of a pane of translucent/transparent tempered or ceramic glass or high temperature plastic positioned to cover at least a portion of an opening of the heating appliance. The phrase "combustion chamber enclosure" may include any enclosure in which flames and/or heat is generated or simulated in the heating appliance. The term "display monitor" is defined as any device that is capable of providing a video display. A "sound system" is defined as any system and/or device that is capable of producing sound. The term "signal module" is defined as any module or device configured to produce analog or digital communication signals such as, for example, video and audio signals.

An example surround entertainment system 10 is shown and described with reference to Figures 1-11. Referring first to Figures 1 and 3, the system 10 includes a surround 12, a display monitor 14, first and second speakers 16, 18, and a signal module 20. The display monitor 14, speakers 16, 18, and signal module 20 are

positioned within recessed portions of the surround 12 so as to be removed from viewing, or may be viewable by adjusting features of the surround, monitor 14, speakers 16, 18, and signal module 20, as will be described further below. When assembled together, the features 12, 14, 16, 18, and 20 provide a modular system 10 that is relatively easy to transport as a single unit and install around a heating appliance with relative ease.

The surround 12 includes a top member 30, a mantel 32, and first and second side members 34, 36 that together define an internal space 38 sized to surround a heating appliance (not shown). Surround 12 also includes first and second sound system recesses 40, 42 formed in the first and second side members 34, 36, a signal module recess 44 formed in the mantel 32, and a display monitor recess 46 (see Figures 6 and 7) also formed in mantel 32. Surround 12 further includes first and second access panels 48, 50 sized to cover the first and second sound system recesses 40, 42, and a third access panel 52 sized to cover the signal module recess 44.

Referring now to Figures 4, 6, 7, 8, 10, and 11, the display monitor 14 includes a frame 60, a display screen 62 and a mounting assembly 64. The mounting assembly 64 includes a base 66, first and second links 68, 70, and a biasing member 72 positioned on opposing sides of the frame 60. The mounting assembly 64 provides adjustment of the frame 60 and display screen 62 between a display position (see Figures 1, 3, 4, 6, and 7) in which the display screen 62 is viewable from a front surface of the surround 12, and a retracted position (see Figures 2, 8, 10, and 11) in which the display monitor 14 is retracted within the display monitor recess 46 and removed from viewing from a front surface of the surround 12.

Display monitor 14 is mounted to a bottom surface 56 of mantel 32 as opposed to being mounted to a top surface 54 of the mantel 32 or other surfaces of the surround 12. Although the display monitor 14 may have any desired size, it is preferred that the display monitor 14 is sized so that it has minimal intrusion into the internal space 38 where the heating appliance is visible. Because of the limited space provided by surround 12 for concealing the display monitor 14, the display monitor 14 preferably

includes a relatively thin frame 62 and display screen 62 provided by, for example, a liquid crystal display (LCD), plasma display, or other flat panel digital display device.

The mounting assembly 64 is just one example configuration for mounting the display monitor 14 and providing adjustability of the display monitor 14 between a stored/retracted position and a display position wherein the display screen 62 is viewable. Other embodiments may include a mounting assembly that is a simple hinge structure or an attachment configuration in which the display monitor 14 is not permanently secured to the surround 12 but is manually moved from a stored position to a viewable position by, for example, hanging the display device from a bracket or hook on the surround 12. In yet further embodiments, the display monitor 14 may be permanently mounted in a display position and the surround 12 includes an additional access panel that is movable to cover the display monitor 14 in one position so as to conceal the display monitor, and movable to a second position in which the display monitor is viewable. Such an access panel may be coupled to the surround 12 using, for example, a hinge, may slide between opened and closed positions, or may be removable all together from the surround 12. In still further embodiments, display monitor 14 may move into a retracted, non-viewable position that is not within a recess portion of the surround 12. In such an embodiment, the frame 60 or portions of the mounting assembly 64 may be at least partially viewable when the display monitor is in a retracted position rather than being completely concealed, as is provided by the embodiments shown in Figures 1-11. In additional embodiments, the display monitor 14 can be retracted and extended into and out of the surround 12 in a substantially linear manner so that the display monitor 14 is maintained within the same plane.

Referring now to Figures 1, 3-5 and 9, the signal module 20 includes a housing 80, a media tray 82, and a plurality of control buttons 84. Signal module 20 can be any signal generating device that preferably generates at least a video signal that can be fed to the display monitor 14 and an audio signal that can be sent to the speakers 16, 18. Example devices that may be used as the signal module 20 include DVD and CD players, or may be a receiver such as a cable or satellite receiver that merely formats and/or transmits a signal provided from a remote source that is fed through the

device 20 to the display monitor 14 or speakers 16, 18. The signal module 20 may include a controller such as a microprocessor and memory wherein a plurality of video and/or audio programs can be stored for selection by a user or downloaded from another device such as a computer that is connected to the Internet for streaming and/or downloading digital signals from a remote source. The media tray 82 may be movable between a closed position (see Figure 9) and an open position (see Figure 5) to receive a media member such as a CDROM or DVD disk.

The display monitor 14, first and second speakers 16, 18, and signal monitor 20 may be controlled and adjusted manually by a user via control buttons or other user interface structures associated with each of the devices 14, 16, 18, 20. In some embodiments, the devices 14, 16, 18, 20 may be controlled from a remote location using, for example, a hand-held remote device or a wall mounted control panel from which control signals are generated and the signals are delivered via a hardwire connection or a wireless connection using any desired communication medium, such as, for example, radio frequency (RF), infrared (IR), ultrasound, cellular, or satellite signals. Optionally, one or more transparent windows or openings can be incorporated into the surround 12 to facilitate wireless connections using a medium such as IR. For example, a transparent window or opening can be incorporated into the third access panel 52 to allow a wireless IR connection to device 20

Some embodiments of the invention may include multiple display monitors, multiple signal modules, and one or more speakers. These devices may be mounted at various locations on surround 12 (e.g., additional orientations to those shown in Figures 1-11). For example, multiple speakers may be mounted within the mantel 32, one or more of the signal modules may be mounted within the side members 34, 36, and one or more display monitors may be mounted to or within the top and first and second side members 30, 34, 36.

Another example surround entertainment system 100 is shown with reference to Figures 12-19 and includes a display monitor 114 coupled to a top surface 154 of the surround 112. System 100 includes a surround 112, a display monitor 114, first and second speakers 116, 118, and a signal module 120. The surround 112

includes a top member 130, a mantel 132, and first and second side members 134, 136 that define an internal space 138 sized to surround a heating appliance (not shown). The surround 112 also includes first and second sound system recesses 140, 142, a signal module recess 144, a display monitor recess 146, and first, second, and third access panels 148, 150, 152.

The display monitor 114 includes a frame 160, a display screen 162, and a mounting assembly 164. The mounting assembly 164 includes a base 166, first and second links 168, 170, and a biasing member 172 coupled on opposing sides of the frame 160 that are used to mount the display monitor 114 to the surround 112 and move the display monitor 114 between a retracted position (see Figures 17-19) in which the display screen 162 is not viewable and a display position (see Figures 12-16) in which the display screen 162 is viewable. When in the retracted position, the display monitor 114 is preferably flush mounted with the top surface 154 of the mantel 132 so as to minimize any interference with the look and feel of the surround 112 and to conceal the display monitor 114 from view when viewing the surround 112 from a front surface. To help camouflage the display monitor 114 when in the retracted position, a back side of the frame 160 (the surface opposing the display screen 162) may be painted or otherwise provided with a surface finish that matches the finish provided on the top surface 156 of the mantel 132.

The links 168, 170 of the mounting assembly 164 facilitate retraction of the display monitor 114 into a position in which the display screen 162 is facing downward in a protected, unexposed position. This may be helpful in protecting the display screen 162 from damage or contaminants that may otherwise be problematic if the display screen were facing upward when in the retracted position. As noted above with reference to system 10, the display monitor 114 may, in other embodiments, be completely detachable from the mounting assembly and manually laid flat with the display screen 162 facing downward within a recess or on top of the top surface 156 of the mantel 132 for storing the display monitor 14. In this embodiment, the display monitor 114 would be manually lifted into a display position and could be attached to the surround in any desired manner either extending upward from the top surface 156 of

the mantel 132 or being mounted with brackets, fasteners, or other attachment means to the mantel 132 or other features of the surround 112 in a desired location and where a video feed (either wire or wireless) to the display monitor 114 is possible.

The first and second access panels 48, 50 and 148, 150 may be may be made from sound permeable materials so as to permit sound generated by the first and second speakers to pass through the panel while substantially concealing the speakers from view. In some embodiments, these access panels may be integrated into the speakers or may be removable or adjustable into a removed position when the speakers are in use.

The third access panel 52, 152 is shown in the Figures as having a hinged attachment to the mantel so as to be easily movable into an open position thereby providing access to the stored signal module. In some embodiments, the control buttons or a control panel of the signal module may be integrated into the third access panel, the third access panel may be slidable relative to the mantel 132 between open and closed positions, or the third access panel may be removable altogether. The signal module may be mounted to a sliding tray or drawer (not shown) within the signal module recess so that the signal module is movable into a more accessible position for accessing the control buttons when the third access panel is in an open position.

Communication between the display monitor, speakers and signal module of the surround as described above may be provided by a hardwire connection or may be a wireless communication. In some embodiments, any wiring or cords associated with the entertainment hardware may be routed to a single location for a distribution to the various devices. In such a configuration, a single power outlet may be provided for the entire surround entertainment system as well as a single panel of connectors (e.g., network, coaxial cable, USB, serial port, parallel port, or any other type or style of connector) so that the surround entertainment system can be easily installed and communication with all of the entertainment hardware devices made accessible from at a centralized location.

Other surround entertainment systems may include additional entertainment hardware devices to those shown in Figures 1-19. For example, the

surround entertainment system may include lights, sources of heat, telephone systems, intercom systems, computer, or other multimedia devices as desired that are in some way mounted to and associated with the surround entertainment system.

In another embodiment, the mantel 32, and first and second side members 34, 36 of the surround 10 are provided in separate parts that can be assembled to form the surround 10. In other embodiments, insulative or heat reflective materials can be incorporated into the surround to isolate the electronic devices used with the surround from heat generated by the fireplace. In yet other embodiments, fan systems can be incorporated into the surround to cool electronic devices.

The present invention should not be considered limited to the particular examples or materials described above, but rather should be understood to cover all aspects of the invention as fairly set out in the attached claims. Various modifications, equivalent processes, as well as numerous structures to which the present invention may be applicable will be readily apparent to those of skill in the art to which the present invention is directed upon review of the instant specification.